

## Claims

- [c1] 1. A high-performance two-phase flow evaporator comprising:
- an electronic device;
  - a casing mounted on said electronic device at a top side;
  - a metal heat sink provided at a top side of said casing and defining with said casing an enclosed chamber;
  - a working fluid contained in said enclosed chamber; and
  - a heat conducting member formed of heat transfer material ( $k > 80 \text{ W/m} \cdot \text{K}$ ) in a bottom wall of said casing;
- wherein said heat conducting member has a bottom contact surface disposed in contact with said electronic device for absorbing heat from said electronic device during working of said electronic device, a top heating surface disposed in contact with said working fluid for transferring heat energy from said bottom contact surface to said working fluid, and at least one groove and/or fin formed in said top heating surface to increase the contact area of said heat conducting member with said working fluid.
- [c2] 2. The high-performance two-phase flow evaporator as claimed in claim 1, wherein said casing is made of a pure

metal material.

- [c3] 3.The high-performance two-phase evaporator as claimed in claim 1, wherein said casing is made of a metal alloy.
- [c4] 4.The high-performance two-phase evaporator as claimed in claim 1, wherein said casing is injection-molded from plastics.
- [c5] 5.The high-performance two-phase evaporator as claimed in claim 1, wherein said working fluid is selected from a group of fluid materials including pure water, solvent containing oxygen, hydrocarbon, and their mixture.
- [c6] 6.The high-performance two-phase evaporator as claimed in claim 5, wherein said solvent containing oxygen includes alcohol, acetone.
- [c7] 7.The high-performance two-phase evaporator as claimed in claim 1, wherein said heat conducting member is an outer shell of said electronic device.
- [c8] 8.The high-performance two-phase evaporator as claimed in claim 1, wherein said electronic device is a CPU (central processing unit).
- [c9] 9.The high-performance two-phase evaporator as

claimed in claim 1, wherein said metal heat sink comprises a flat base that covers a top side of said casing, and a plurality of radiation fins upwardly extended from a top or/and bottom wall of said flat base.

[c10] 10. The high-performance two-phase flow evaporator as claimed in claim 9, wherein said flat base of said heat sink has at least one groove in a bottom surface thereof facing the inside of said enclosed chamber.

[c11] 11. The high-performance two-phase flow evaporator as claimed in claim 1, further comprising metal and ceramic grains/powder put in said enclosed chamber.

[c12] 12. The high-performance two-phase flow evaporator as claimed in claim 1, further comprising steam guide means provided inside said enclosed chamber and adapted to guide steam from said working fluid to said heat sink.